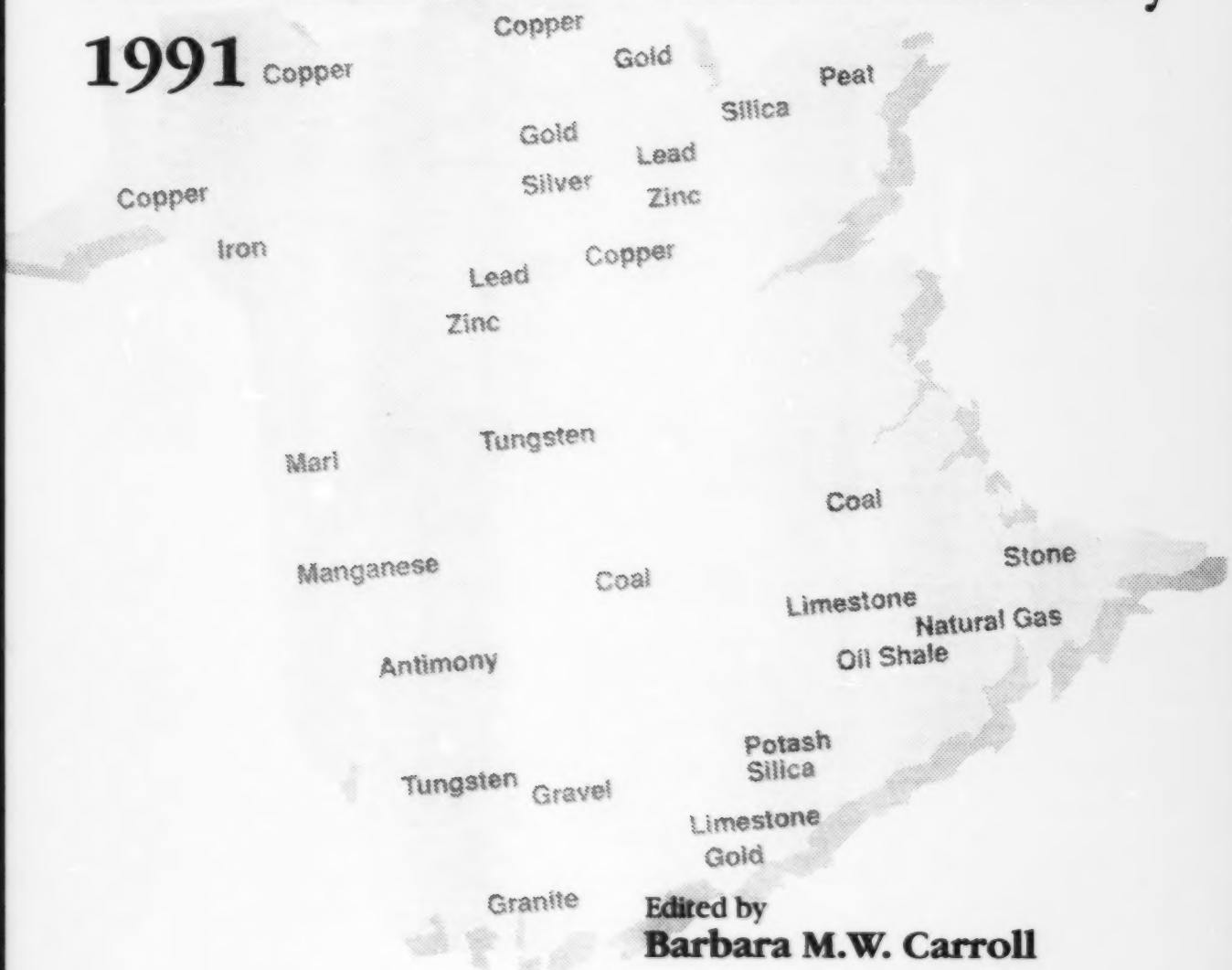
New Nouveau
Brunswick

Reference 34

Preliminary Review of New Brunswick's Mineral Industry 1991



Edited by
Barbara M.W. Carroll

Natural Resources and Energy
Mineral Resources

March, 1992

Reference 34

Preliminary Review of New Brunswick's Mineral Industry

1991

This report has been prepared by:

Mineral Resources
Department of Natural Resources and Energy
Province of New Brunswick

Hon. Alan R. Graham
Minister of Natural Resources and Energy

Hon. Doug Tyler
Minister of State for Mines and Energy

March, 1992

New Nouveau
Brunswick

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Preliminary Review of New Brunswick's Mineral Industry

1991

Edited by

Barbara M.W. Carroll

Natural Resources and Energy

Mineral Resources

March, 1992

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Department of Natural Resources and Energy
Fredericton, New Brunswick

To all user groups:

It is with pleasure that I present, on behalf of the Minister of Natural Resources and Energy, the "Preliminary Review of New Brunswick's Mineral Industry, 1991."

This report demonstrates the importance of the mineral industry to the economy of New Brunswick. It supports our views that exploration, technology and value-added developments are the major priorities for this sector.

Overall, the mineral industry has maintained a fairly stable level of activity considering the strike at Brunswick Mining and Smelting Corporation Limited and the present general economic conditions.

I would like to thank you for your continued support and hope that this document will be of use to those associated with the mineral industry.

Yours sincerely,

DOUG TYLER
Minister of State for Mines and Energy

Ministère des Ressources naturelles et de l'Énergie
Fredericton (Nouveau-Brunswick)

À tous les groupes d'usagers

J'ai le plaisir de vous présenter, au nom du ministère des Ressources naturelles et de l'Énergie, la "Rétrospective préliminaire de l'industrie minérale au Nouveau-Brunswick, 1991."

Ce rapport démontre l'importance de l'industrie minérale pour l'économie du Nouveau-Brunswick. Il appuie notre conviction que l'exploration, la technologie et la valeur ajoutée des développements représentent les priorités de ce secteur.

Dans l'ensemble, l'industrie minérale a conservé un niveau d'activités passablement stable compte tenu de la grève à la mine Brunswick Mining and Smelting Corporation Limited et des conditions économiques générales actuelles.

Je vous remercie de votre appui soutenu et j'espère que ce document sera utile aux personnes associées à l'industrie minérale.

Je vous prie d'agréer l'expression de mes sentiments distingués.

Le ministre d'État aux Mines et à l'Énergie,

DOUG TYLER

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ABSTRACT

The preliminary value of New Brunswick's mineral production for 1991 is $617 007 529, a decrease of 30% from 1990. The number of people directly employed in the mineral industry remained constant at 5000.

Metals accounted for 52.7% of the total value of production. Of the metals, zinc, lead, copper, and silver made the largest contribution. The strike at Brunswick Mining and Smelting Corporation Limited operations ended in May of 1991. At its Brunswick No. 12 mine, the company has cut its costs by 15% and increased efficiency by 30%. Heath Steele Mines successfully completed its economic feasibility review of the C zone deposit. An Environmental Impact Assessment screening resulted in conditional approval of this project. Murray Brook Resources Inc. exceeded its design production and recovery rate. The company is reviewing the feasibility of mining the copper zone of its Murray Brook mine. Stratabound Minerals Corp. completed a study of the economic feasibility of mining the Captain North Extension deposit. Operations were suspended at the Marshall Minerals Corp. (Restigouche) and East West Caribou Mining Limited (Caribou) mines.

Nonmetallic minerals contributed 34.4% to the value of production. The main commodities are potash, peat, salt, and sulphur.

Fuels production, mainly coal, was valued at $34 200 000. N.B. Coal Limited has continued to reclaim lands disturbed by mining. Irving Oil Limited produced a small amount of natural gas from the Stoney Creek field until March 31, 1991 when operations were terminated.

Structural materials such as lime, stone, and sand and gravel contributed about 7% to the value of production.

In 1991, approximately 55 companies spent $13 900 000 exploring for minerals in the Province. Brunswick Mining and Smelting Corporation Limited, Noranda Exploration Company, Limited, Teck Exploration Ltd., and NovaGold Resources Inc. were the largest contributors. BHP-Utah Mines Ltd, Teck Corporation, and Phelps Dodge Corporation of Canada Ltd. became new players in the exploration of northern New Brunswick, where the focus was on base metals in the Bathurst camp and the adjacent Sewell Brook area. During 1991, two mineralized zones, HC-4 and C-North, were discovered at Heath Steele. In southern New Brunswick, interest was focused on gold in the Annidale and Cape Spencer terranes and on base metals in the Annidale belt. Indium has rekindled interest in the Mount Pleasant area of southern New Brunswick.

The year has been a challenging one for New Brunswick's mineral industry. Although the resource sector is slower to show the effects of the recession than the manufacturing sector, the consequences of this extended downturn are now being felt. An excess of minerals in the marketplace is expected to delay improvement in prices well into 1992, even though economic conditions may have improved.

RÉSUMÉ

La valeur préliminaire de la production de minéraux du Nouveau-Brunswick en 1991 est estimée à 617 007 529 $, soit une baisse de 30 p. 100 par rapport à 1990. Le nombre de personnes directement employées dans l'industrie minérale est demeuré constant à 5 000.

Les métaux ont représenté 52,7 p. 100 de la valeur totale de la production. Parmi les métaux, les principales contributions sont venues du zinc, du plomb, du cuivre et de l'argent. La grève à l'exploitation de Brunswick Mining and Smelting Corporation Limited a pris fin en mai 1991. La société a réduit ses coûts de 15 p. 100 et elle a accru son efficience de 30 p. 100 à sa mine Brunswick no 12. Heath Steele Mines a fructueusement terminé son étude de rentabilité du gisement de la zone C. Le

processus de sélection de l'étude d'impact sur l'environnement a abouti à une approbation conditionnelle de ce projet. Murray Brook Resources Inc. a surpassé son taux prévu de récupération et de production. La société est en train d'analyser la faisabilité de l'extraction de la zone de cuivre de sa mine de Murray Brook. Stratabound Minerals Corp. a terminé une étude de rentabilité de l'extraction du gisement Captain North Extension. Les travaux ont été suspendus aux mines de la Marshall Minerals Corp. (Restigouche) et d'East West Caribou Mining Limited (Caribou).

Les minéraux non métalliques ont fourni 34,4 p. 100 de la production totale. Les principaux produits de ce type sont la potasse, la tourbe, le sel et le soufre.

La production de combustibles, principalement du charbon, est évaluée à 34 200 000 $. N.B. Coal Limited a continué à restaurer les terres perturbées par l'extraction minière. L'Irving Oil Limited a produit une petite quantité de gaz naturel du champ Stoney Creek jusqu'au trente et unième mars 1991, date où cette exploitation a pris fin.

La production de matériaux de construction, comme la chaux, la pierre, le sable et le gravier a contribué environ 7 p. 100 de la production totale.

En 1991, une cinquantaine cinq de sociétés ont investi quelque 13 900 000 $ dans la prospection minérale dans la province. Brunswick Mining and Smelting Corporation Limited, Noranda Exploration Company Limited, Teck Exploration Ltd. et NovaGold Resources Inc. ont été les sociétés les plus actives à cet égard. BHP-Utah Mines Ltd., Teck Corporation et Phelps Dodge Corporation of Canada Ltd. sont des nouvelles venues dans le secteur de la prospection au nord du Nouveau-Brunswick, où l'on se concentre surtout sur les métaux communs du camp de Bathurst et de la région adjacente de Sewell Brook. Au cours de 1991, deux zones minéralisées, HC-4 et C-North, ont été découvertes à Heath Steele. Dans le sud du Nouveau-Brunswick, on s'est principalement intéressé à l'or dans les gisements d'or d'Annidale et de Cape Spencer, et aux métaux communs dans la ceinture d'Annidale. L'indium a suscité de l'intérêt dans la région de Mount Pleasant, au sud du Nouveau-Brunswick.

Ce fut une année stimulante pour l'industrie minérale du Nouveau-Brunswick. Même si le secteur des ressources prend plus de temps à accuser les effets de la récession que le secteur manufacturier, les conséquences du ralentissement prolongé se font maintenant sentir. Un surplus de minéraux au sein du marché devrait retarder l'amélioration des prix pendant une bonne partie de 1992, même si les conditions économiques s'améliorent.

PRELIMINARY REVIEW OF NEW BRUNSWICK'S MINERAL INDUSTRY 1991

EXPLORATION

Metallic Minerals

A preliminary survey, conducted in November of 19.. by the Mineral Resources Division in cooperation wi.. Energy, Mines and Resources Canada, determined that exploration expenditures for about 55 companies in New Brunswick was $13 900 000. The survey included only those expenditures on general exploration (i.e., all programmes except those at mine sites). The forecasted exploration expenditure for 1992 is $14 700 000.

The primary exploration targets continued to be base metals in and surrounding the Bathurst camp of northern New Brunswick and gold and base metals in the Annidale area of southern New Brunswick (Figure 1). There was renewed interest in tin deposits of the Mount Pleasant area of southern New Brunswick. The number of claims staked and renewed during the year increased by 5% and 11%, respectively. A total of 21 350 claims were in effect in 1991.

Northern New Brunswick Exploration expenditures in northern New Brunswick during 1991 were approximately $9 500 000 according to the results of an unofficial telephone poll taken at the end of October. The 1990 total, $11 000 000, was determined by the same method. In total, Noranda Exploration Company, Limited and Brunswick Mining and Smelting Corporation Limited spent about $6 000 000, down $1 500 000 from 1990. However, during the year a few companies became new players in northern New Brunswick exploration. With one exception, the focus of exploration was on base metals. The number of claims recorded had increased slightly, from 3750 in 1990 to 3910 in 1991.

Noranda Exploration Company, Limited concentrated its efforts (more than half of its $4 700 000 expenditure) in the Heath Steele–Stratmat–Halfmile Lake area. Two new discoveries were made at Heath Steele (Figure 2: 1), one was the HC-4 zone (west of the C zone) and the other was on the C-North zones. Follow-up drilling is in progress. Delineation of the Stratmat S-1 deposit (Figure 2: 2) has been completed and an economic evaluation is underway. The remaining expenditures were about equally divided among properties within and outside the Bathurst camp. A 3.35 m intersection grading 0.75% Pb, 6.18% Zn, and 0.16% Cu was made within a sedimentary horizon on the east limb of the Strachens Lake deposit (Figure 2: 3). Outside the Bathurst camp, there were three main target areas: Shingle Gulch (Figure 3: 1), McKenzie Gulch (Figure 1: 1), and Patapedia (Figure 1: 2). Grid work and trenching were conducted on all three properties and drilling of selected targets is planned. However, the discovery of a new copper showing by Raoul Legacy prompted Noranda to stake an additional 150 claims in the McKenzie Gulch area, where an intensive exploration/drilling programme was underway by the end of 1991.

Brunswick Mining and Smelting Corporation Limited spent approximately $1 400 000 on its properties during 1991. More than half of this amount was for drilling on the company's Northend zone near the No. 12 mine (Figure 2: 4). Since 1989, eighteen holes have been completed; two are currently in progress. These two holes are critical because they are testing the only area where the mineralized zone remains open. Previously, drilling showed that the zone dies out (or more likely is cut out by a thrust fault) to the north.

Much of the remaining exploration effort was in the vicinity of the mined-out No. 6 deposit (Figure 2: 5). A deep-electromagnetic (deep-EM) survey was completed over the area but "cultural noise" from water lines, power lines, etc. caused interpretation difficulties. In the fall, three deep holes were drilled at Austin Brook to test the sulphide zone associated with the iron formation.

Teck Corporation opened an office in Bathurst in June, shortly after acquiring about 650 claims in the Bathurst camp. Stratabound Minerals Corp. has entered into an exploration/joint venture agreement with Teck Corporation that will include the following Stratabound properties in New Brunswick: the CNE property (except the CNE open pit), Taylor Brook, Stratmat West, and Stratmat North. In return for the right to earn 51% interest in these properties, Teck has agreed to pay Stratabound $50 000 upon signing the four-year agreement. Teck will also purchase $87 500 worth of Stratabound shares on each of the three anniversary dates after the deal is signed and $200 000 on the fourth anniversary. In exercising its option to buy shares, Teck

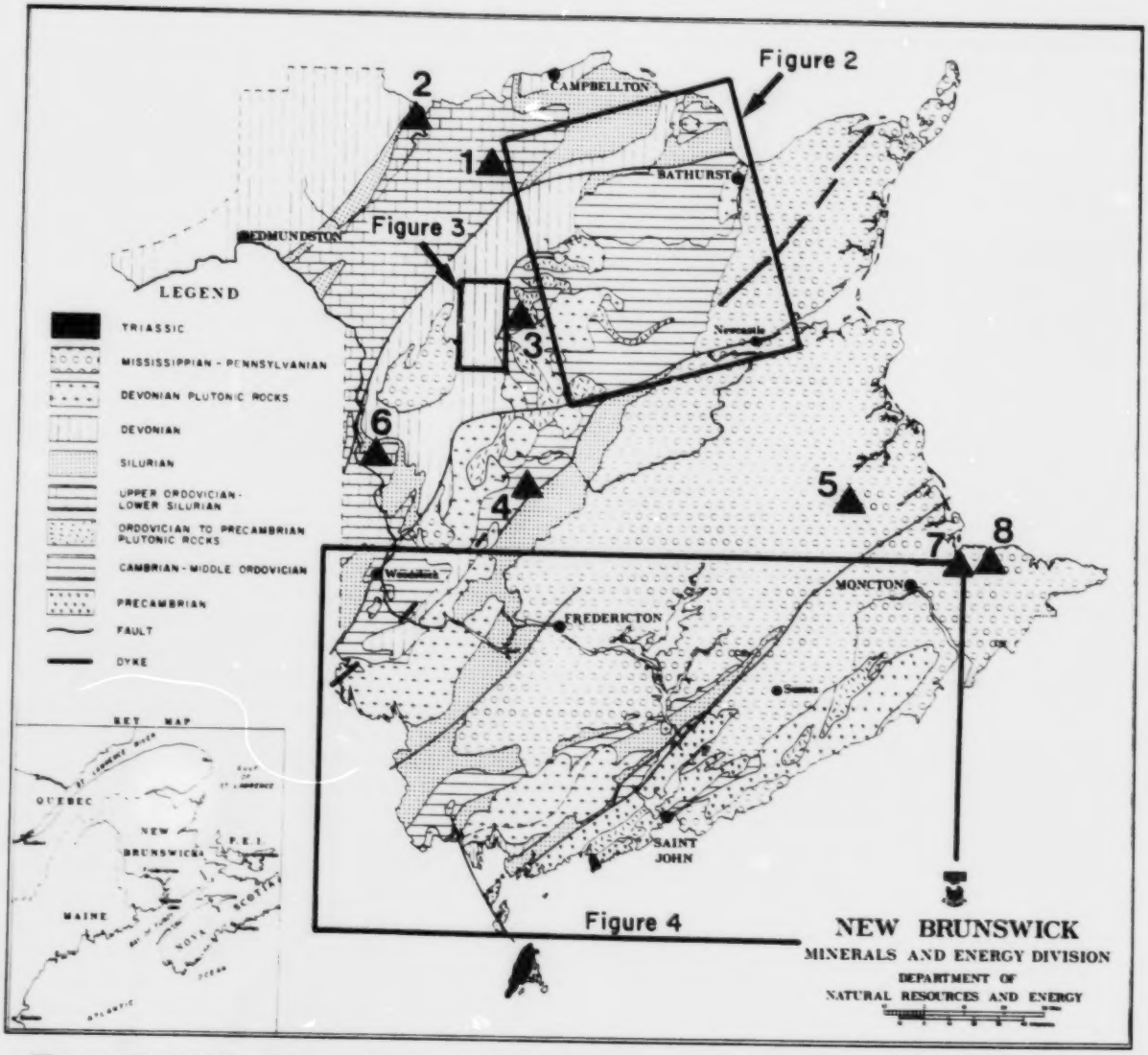


Figure 1. Generalized geology of New Brunswick, showing the location of some prospects and mineral deposits. Others are shown on the more detailed maps outlined here: the Bathurst camp (Figure 2), the Trousers Lake (Sewell Brook) area (Figure 3), and southern New Brunswick (Figure 4).

1. Claims, Burntland Lake (Brunswick Mining and Smelting Corporation Limited)
2. Claims, Patapedia (Brunswick Mining and Smelting Corporation Limited)
3. Claims, Sears Lake (NovaGold Resources Inc.)
4. Claims, Winding Hill (Brunswick Mining and Smelting Corporation Limited)
5. Beersville deposit (N.B. Power) coal
6. White Mud Lake (Upper Kent Lime Works Ltd.) marl
7. Shediac area quarry (Smith Cut Stone and Quarries Ltd.) dimension stone
8. Shediac area quarry (Dupuis Cut Stone Ltd.) dimension stone

must pay the greater of: the current market price, or a minimum progressive price ($2.00, $2.25, $2.50, and $2.75 per share, respectively, on each of the anniversary dates). The company must also spend a minimum of $300 000 in the first year of the agreement and $250 000 in each subsequent year. A total of $3 000 000 must be spent by the end of the agreement or the properties revert back to Stratabound with no compensation to Teck.

Preliminary exploration has been completed on most of the claims. Trenching was completed on the claim group north of the No. 12 mine (Figure 2: 6) and a number of holes were drilled in the vicinity of the Captain North Extension (CNE) deposit (Figure 2: 7).

NovaGold Resources Inc. follows Noranda, Brunswick, and Teck in total exploration expenditures for northern New Brunswick. Early in the year, four holes were drilled near Sears Lake (Figure 1: 3) to test induced polarization (IP) anomalies in an area where geochemical samples yielded highly anomalous lead–zinc. A 25-hole definition drilling programme on the Sewell Brook discovery (Figure 3: 2) was completed by March, showing that the deposit is a classic Kuroko-type; one zone contains approximately 25 000 t grading 20% combined lead–zinc. In the spring, an airborne survey was flown over the 129-claim Sears Lake group. In May, a joint venture agreement that included both Sears Lake and Sewell Brook properties was made with Kennecott Canada Inc.; NovaGold continued as the operator. Subsequently, 320 line kilometres of grid was established over the 182-claim Sewell Brook group to permit detailed mapping, prospecting, and geophysical surveys of the ground outside the discovery zone. Drill targets were tested in November of 1991. Another 33 claims were added to the Sears Lake block.

NovaGold also investigated its 33-claim California South property, part of a 124-claim block east of California Lake (Figure 2: 8). An IP survey was conducted and the resulting anomalies were trenched in the early fall. Samples of a copper-bearing chloritic and siliceous sedimentary unit discovered in one trench yielded up to 5.5% copper. Subsequently, five shallow holes were drilled; one intersected a 3 m section grading 2.93% Cu and another cut a 1.2 m section grading 2.46% Cu. A follow-up gravity survey was conducted over the mineralized area in December; further drilling is planned.

In addition, NovaGold completed a feasibility study on its Murray Brook copper zone (Figure 2: 9) in 1991.

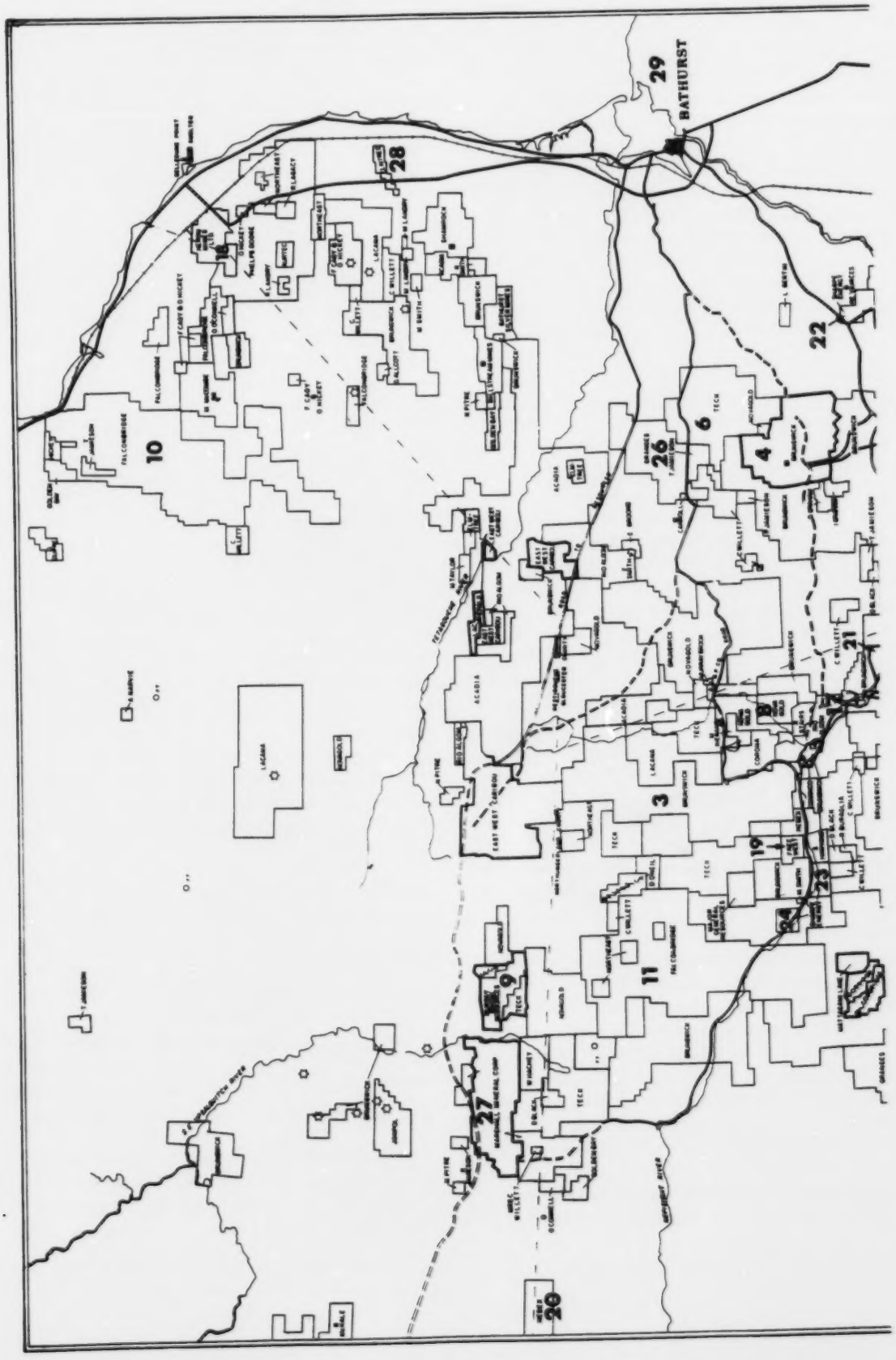
Falconbridge Limited completed 1500 m of drilling on its Nash Creek property (Figure 2: 10) in the late spring of 1991. However, most of the company's exploration effort was focused on its West Bathurst property in the Halfmile Lake–Devils Elbow–TV Tower area (Figure 2: 11). Early in the fall, a 2750 m drilling programme was completed in the northern part of this property. No results have been released.

BHP-Utah Mines Ltd. is another new player in northern New Brunswick mineral exploration. The company is operating independent exploration programmes from its Canadian and American offices. The Toronto office conducted preliminary exploration on its 186-claim Gordon Meadow property (Figure 2: 12), between Key Anacon and Brunswick No. 6. This culminated in a trenching programme in the late fall. The Bangor office managed the company's 369-claim block near Plaster Rock (Figure 3: 3) and carried out reconnaissance in the southern part of the Bathurst camp. Another 280 claims were added to the Gordon Meadow property during the summer and another 100-claim block was staked near Guagus Lake in the southern part of the camp (Figure 2: 13).

Rio Algom Exploration Inc. drilled five holes on its 273-claim Nepisiguit Brook property (Figure 2: 14). Three holes were drilled in the latter part of 1990. One hole containing iron formation was deepened and two additional holes were drilled early in 1991 to test gravity targets. In February, the 162-claim Nepisiguit South group (Figure 2: 15) was staked south of the Captain deposit and the 118-claim Taylor Brook group was staked along Nepisiguit River (Figure 2: 16). During the summer, exploration was focused on claims in the vicinity of the Wedge deposit (Figure 2: 17) in order to identify drill targets.

Phelps Dodge Corporation of Canada Ltd., another newcomer to the area in 1991, optioned the 64-claim Turgeon property (Figure 2: 18) belonging to Heron Mines Limited. A 700 m drilling programme began in late October to test a previously identified but little explored zinc zone. Previous work on the property had outlined a Cyprus-type massive sulphide deposit containing 1 to 2 000 000 t of ore grading approximately 4% Zn and 1.5% Cu. In November, about 400 additional claims were staked around the Turgeon property.

Stratabound Minerals Corp. carried out development work on its Captain North Extension (CNE) deposit (Figure 2: 7) and general exploration on some of its other claim groups prior to signing a letter of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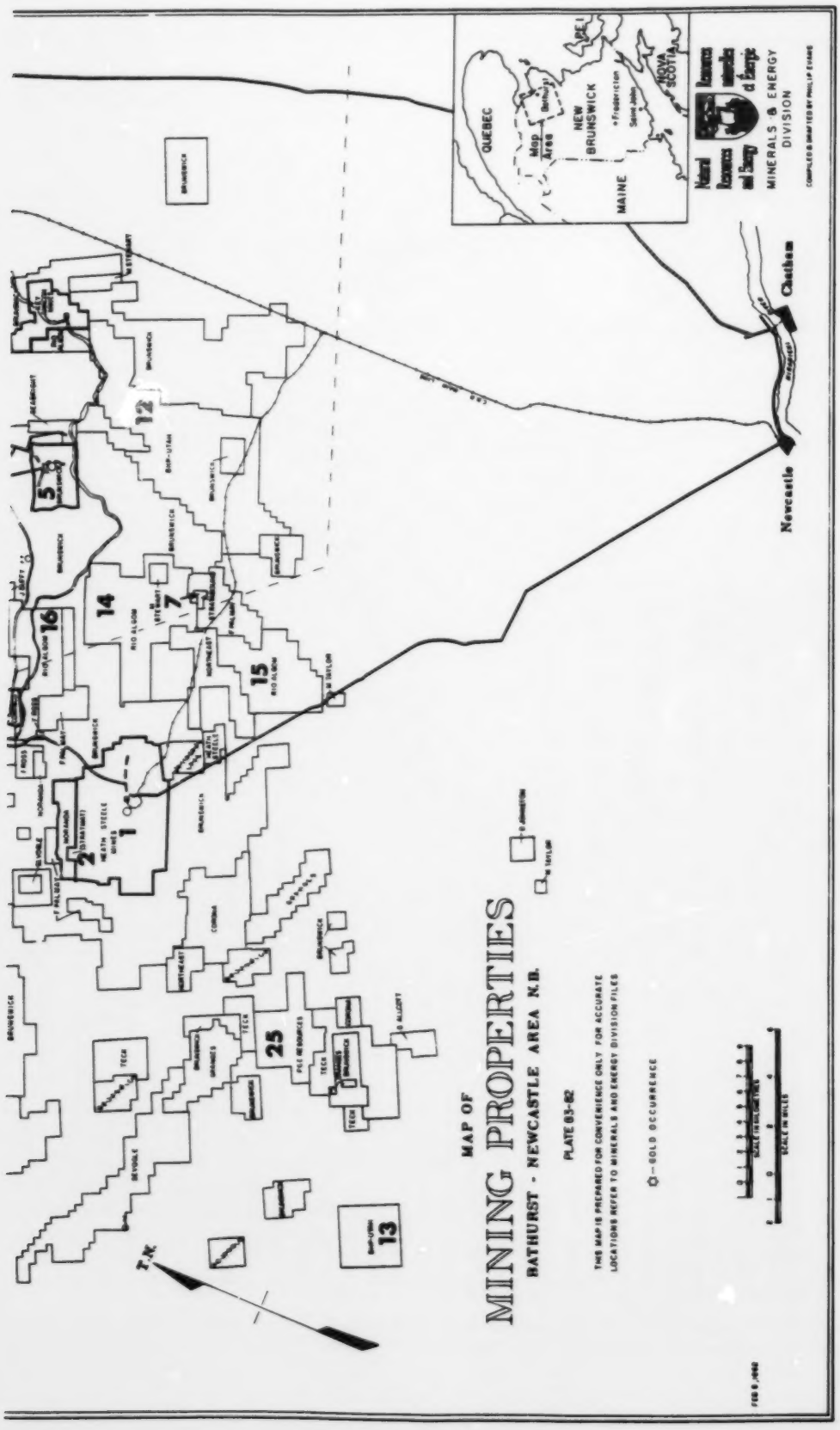

Figure 2. Mineral properties in the Bathurst camp, northern New Brunswick (February 1992). Legend is on following page.

LEGEND (Figure 2)

1. Heath Steele mine (Heath Steele Mines) zinc, lead, silver, copper
2. Stratmat S-1 deposit (Heath Steele Mines) zinc, lead, silver, copper
3. Claims, Strachens Lake (Brunswick Mining and Smelting Corporation Limited)
4. Brunswick No. 12 mine (Brunswick Mining and Smelting Corporation Limited) zinc, lead
5. Brunswick No. 6 property (Brunswick Mining and Smelting Corporation Limited)
6. Claims, Brunswick Extension (Teck Corporation)
7. Captain North Extension (N. Pitre/Stratabound Minerals Corp.) massive sulphides
8. Claims, California South (NovaGold Resources Inc.)
9. Murray Brook deposit (Murray Brook Resources Inc.) base metals, gold, silver
10. Claims, Nash Creek (Falconbridge Limited)
11. Claims, Halfmile Lake–Devils Elbow–TV tower area (Falconbridge Limited)
12. Claims, Gordon Meadow (BHP-Utah Mines Ltd.)
13. Claims, Barracks Brook (BHP-Utah Mines Ltd.)
14. Claims, Nepisiguit Brook (Rio Algom Exploration Inc.)
15. Claims, Nepisiguit South (Rio Algom Exploration Inc.)
16. Claims, Taylor Brook (Rio Algom Exploration Inc.)
17. Claims, Wedge (Rio Algom Exploration Inc.)
18. Claims, Turgeon deposit (Heron Mines Ltd.)
19. Claims, Fogans Lake (Freewest Resources Inc.)
20. Claims, Moose Brook (Nebex Resources Ltd.)
21. Claims, Nepisiguit-Mosher (Cominco Ltd.)
22. Claims, Key Anacon area (Sharpe Energy and Resources Limited)
23. Claims, Nepisiguit (Sharpe Energy and Resources Limited)
24. Claims, Indian Falls (Sharpe Energy and Resources Limited)
25. Claims, Bills Lake (PGE Resource Corp.)
26. Claims, Middle River (Granges Inc.)
27. Restigouche deposit (Marshall Minerals Corp.) zinc, lead, silver
28. Caribou deposit (East West Caribou Mining Limited) zinc, lead
29. Elmtree deposit (Elmtree Resources Ltd.) limestone
30. Bass River deposit (Elmtree Resources Ltd.) silica

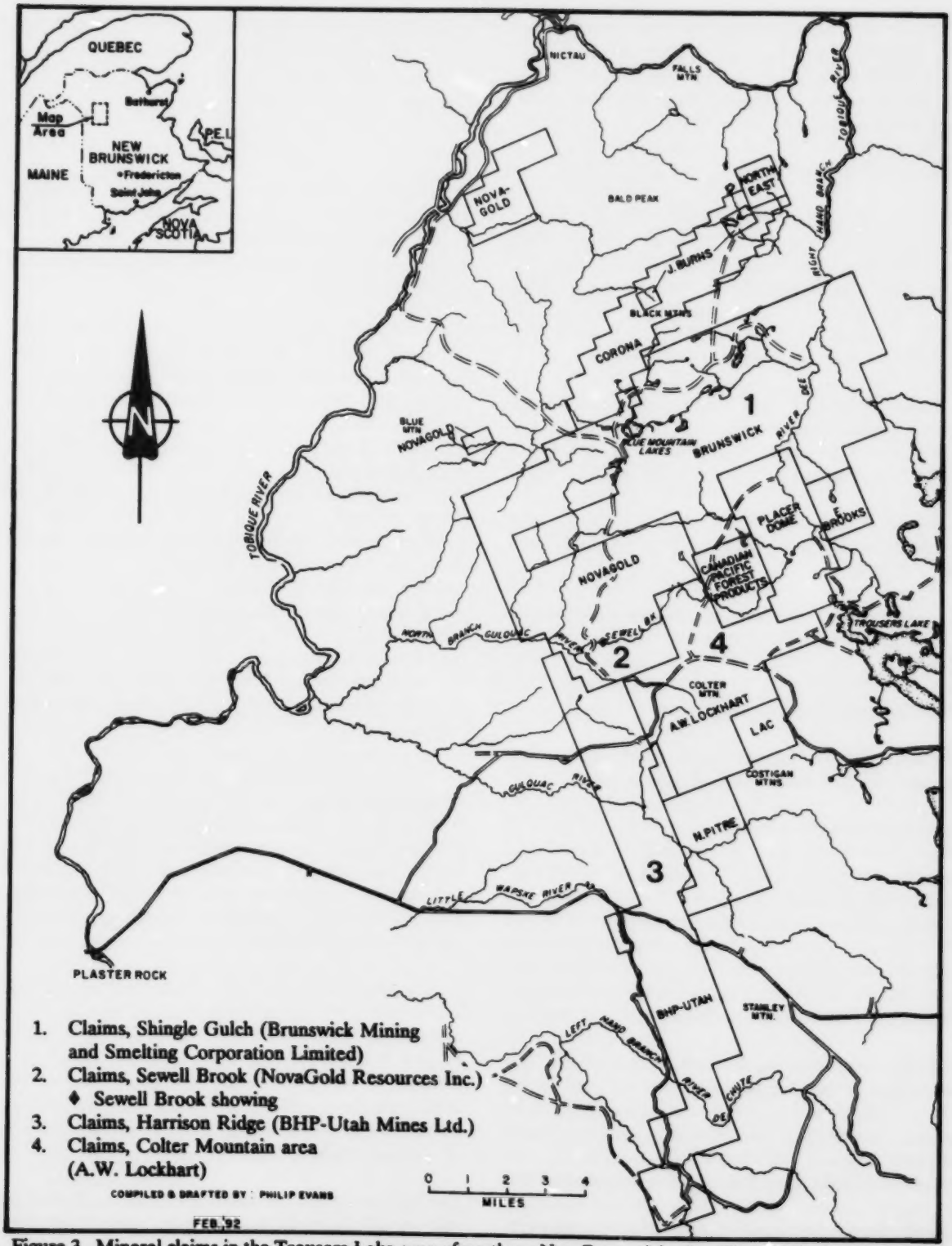

Figure 3. Mineral claims in the Trousers Lake area of northern New Brunswick. See Figure 1 for location map.

agreement with Teck Corporation. In September of 1991, 13 500 t of ore had been mined and shipped to Heath Steele for milling. Notably, the company found new reserves to equal the amount that had been mined. The average grade of the ore mined was about 12% Zn, 5% Pb, and 170 g/t Ag. An additional 13 500 t of ore, mined before the year's end, had not been milled.

Freewest Resources Inc. worked on two properties, a 144-claim block in the Plaster Rock area (Figure 3: 4) and an 18-claim block near Fogans Lake (Figure 2: 19), in the west-central part of the Bathurst camp. One trench was dug at Fogans Lake in an unsuccessful attempt to find the bedrock source of base-metal-bearing boulders. Further work is planned for 1992.

Nebex Resources Ltd. found base-metal-bearing rhyolite boulders associated with a linear magnetic anomaly on its 100-claim Moose Brook group (Figure 2: 20). Grab samples yielded 2.37% Pb and 1.15% Zn.

Cominco Ltd. drilled one hole on its 27-claim Nepisiguit-Mosher group (Figure 2: 21). No results have been released.

Sharpe Energy and Resources Limited staked claims in three areas of the Bathurst camp: northwest of Key Anacon, near the mouth of Moody Brook, and near Indian Falls (Figure 2: 22, 23, and 24, respectively). The company acquired a total of 61 claims.

PGE Resource Corp. conducted a deep-EM survey over part of its 98-claim Bills Lake group (Figure 2: 25).

Granges Inc., the only company not looking for base metals, drilled one hole on its Middle River gold property (Figure 2: 26). The company tested the northeasterly extension of a very low frequency (VLF) anomaly associated with known gold-bearing rocks. A wide cross-cutting alteration zone was encountered within a siltstone–wacke sequence. Two core intercepts from the alteration zone, 4.2 m and 2.8 m long, graded 9.4 g/t and 10.1 g/t Au, respectively. More work is planned.

Other companies that held claims in northern New Brunswick but who reported little or no work during 1991 include: *Placer Dome Inc., Corona Corporation, Acadia Mineral Ventures Limited (Guinness Gold Resources Limited), Seabright Exploration Inc. (Corner Bay Minerals Inc.), East West Caribou Mining Limited, Key Anacon Mines Limited, Major General Resources Limited, Sevogle Exploration Inc., Marshall Minerals Corp., LAC Minerals Limited, Shamrock Resources Inc., Aurtec Mining Development Inc., Golden Bay Resources, Northeast Exploration Services Limited,* and *North American Rare Metals Ltd.*

Southern New Brunswick During 1991, base metal exploration in this region was revived though the interest in gold exploration continued. There was also a renewed interest in tin and associated rare elements, including indium and bismuth.

Brunswick Mining and Smelting Corporation Limited actively explored for base metals in the region. The company conducted geochemical and geophysical surveys and diamond drilling in several areas, including: (1) the Winding Hill area (Figure 1: 4) in the southwestern Miramichi Zone, which has potential for Ordovician volcanogenic massive sulphide deposits; (2) the Little McDougall Lake and Henderson Settlement areas (Figure 4: 1 and 2) in the Annidale belt, which has potential for Kuroko-type base metal sulphide deposits similar to those found in the Penobscot Bay area of southeastern Maine; and (3) the Peekaboo Corner, Cedar Camp, Albert Mines, and Hopewell Cape areas (Figure 4: 3, 4, 5, and 6, respectively) in southeastern New Brunswick, which are underlain by Carboniferous limestone and clastic sedimentary rocks. The limestone has potential for Mississippi-Valley-type base metal sulphide deposits.

During the fall of 1991, *BHP-Utah Mines Ltd.* staked a large claim group in the southwestern Miramichi Zone, south of Benton (Figure 4: 7). This area has potential for volcanogenic massive sulphide deposits. Local prospectors, *Robert Connor* and *Patrick Marr*, also staked and explored claim groups over base metal occurrences and geochemical anomalies in the southwestern Miramichi Zone (Figure 4: 8 and 9).

Corner Bay Minerals Inc. conducted a geophysical survey and a diamond-drilling programme near a base metal prospect west of the old settlement of Annidale (Figure 4: 10) in the St. Croix–Annidale Zone. The prospect is underlain by an Ordovician volcanic and sedimentary sequence that could host Kuroko-type base metal deposits similar to those in the Penobscot Bay area of southeastern Maine.

Gold exploration remained active in the Ordovician volcanic and sedimentary rocks in the eastern part of the

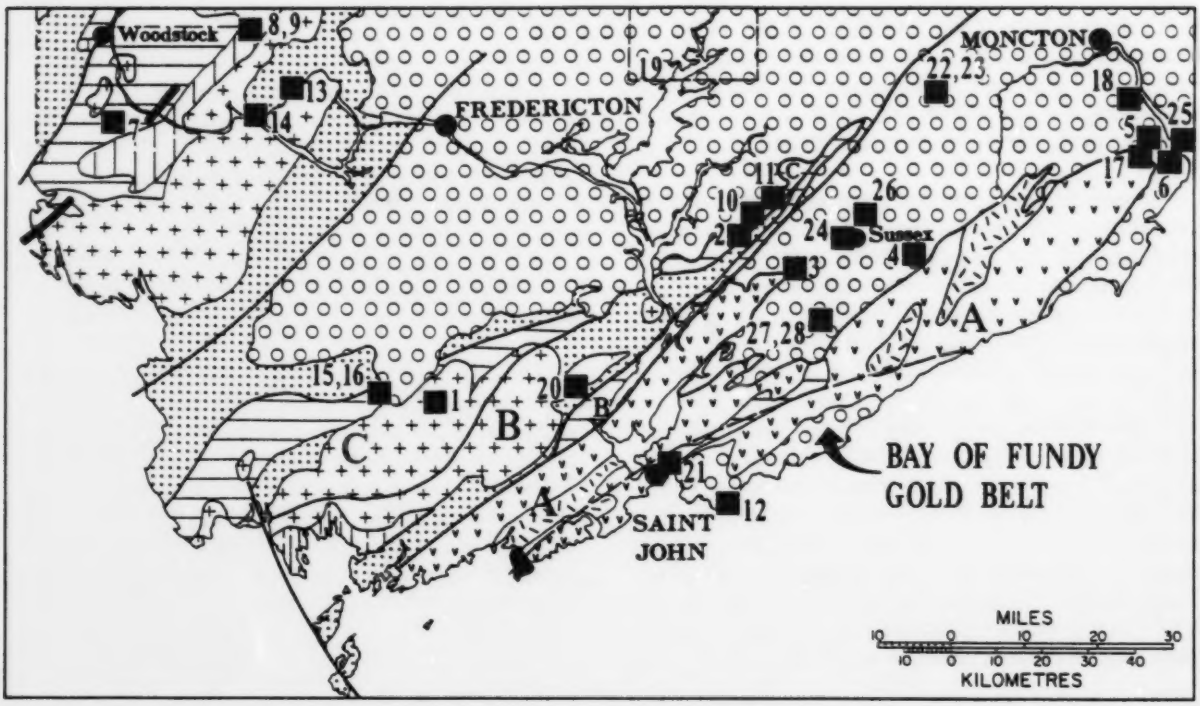

Figure 4. Mineral properties in southern New Brunswick, 1991.

LEGEND

A: Caledonia Zone B: Mascarene–Nerepis Zone C: St. Croix–Annidale Zone

1. Claims, Little McDougall Lake (Brunswick Mining and Smelting Corporation Limited)
2. Claims, Henderson Settlement (Noranda Exploration Company, Limited)
3. Claims, Peekaboo Corner (Brunswick Mining and Smelting Corporation Limited)
4. Claims, Cedar Camp (Brunswick Mining and Smelting Corporation Limited)
5. Claims, Demoiselle Creek (Brunswick Mining and Smelting Corporation Limited)
6. Claims, Hopewell Cape (Brunswick Mining and Smelting Corporation Limited)
7. Claims, Eel River (BHP-Utah Mines Ltd.)
8. Claims, Howland Ridge (Robert Connor)
9. Claims, Brewers Mills (Patrick Marr)
10. Claims, Annidale (Seabright Exploration Inc.)
11. Claims, Annidale (PGE Resource Corp.)
12. Claims, Cape Spencer area (Mispec Resources Inc.)
13. Claims, Springfield (Brunswick Mining and Smelting Corporation Limited)
14. Claims, Coac (Robert Connor)
15. Mount Pleasant deposit (LAC Minerals Limited/Billiton Metals Canada Ltd.) tin, tungsten
16. True Hill occurrence, tin
17. Bituminous Shale Lease 86-1 (Canadian Occidental Petroleum Limited
18. Stoney Creek field (Irving Oil Limited) natural gas
19. Minto–Chipman area (N.B. Coal Limited) coal
20 Blagdon pit (Brunswick Ready-Mix Concrete Ltd.) granular aggregate
21. Brookville quarry (Brookville Manufacturing Company Limited) limestone
22. Havelock area (Lafarge Canada Inc.) limestone
23. Havelock (Havelock Lime) limestone
24. Sussex (Nelson Monuments Ltd.) dimension stone
25. Fort Folly Point area (BEE Stone Company Inc.) dimension stone
26. Sussex area mine (Potash Company of America) potash
27. Salt Springs mine (Potacan Mining Company) potash
28. Cassidy Lake deposit (Sussex Silica Limited) silica

St. Croix–Annidale Zone northwest of the Town of Sussex and in the Caledonia Zone along the Bay of Fundy coast. Gold exploration also was initiated in skarn zones along the contact aureole of the large Devonian Pokiok granodiorite intrusion in the Woodstock area.

Brunswick Mining and Smelting Corporation Limited conducted extensive geochemical and geophysical surveys, trenching, and diamond-drilling for gold in the Little McDougall Lake and Henderson Settlement areas of the St. Croix–Annidale Zone (Figure 4: 1, 2). Prominent gold-bearing, silicified and carbonatized shear zones were discovered in several localities. The discovery outcrop yielded assays of up to 6 g/t Au. *Corner Bay Minerals Inc.* conducted diamond drilling on a gold prospect in the Annidale area (Figure 4: 10). Previous drilling intersected a prominent shear zone that yielded 1.37 g/t and 3.12 g/t Au over 1.5 m and 1.6 m intervals, respectively. *PGE Resource Corp.* also explored an extensive claim group in the St. Croix–Annidale Zone (Figure 4: 11). The company delineated a gold–base-metal-bearing quartz–carbonate vein system containing abundant chrome mica along a major shear zone.

Acadia Mineral Ventures Limited, a subsidiary of Hecla Mining Company Ltd., completed an extensive geochemical, geophysical, and diamond-drilling programme on the Mispec Resources Inc. gold property in the Caledonia Zone, southeast of Saint John (Figure 4: 12). Other companies actively exploring in the Caledonia Zone include *PGE Resource Corp.* and *Maritime Resource Research Ltd.*

Brunswick Mining and Smelting Corporation Limited conducted a diamond drilling programme in the Springfield area in the northeastern contact aureole of the Pokiok Batholith (Figure 4: 13). Gold mineralization in this area is associated with a prominent intensely silicified and carbonatized breccia zone. Farther to the southwest along the contact of the batholith, local prospector *Robert Connor* staked claims and prospected for gold at Coac Stream (Figure 4: 14).

Interest was renewed in the Mount Pleasant tin deposits (Figure 4: 15) because of their indium potential. This has also reactivated interest in other tin prospects in the area. A small staking rush was initiated by the discovery of high-grade tin-bearing angular float at True Hill (Figure 4: 16) west of Mount Pleasant by D.G. Rose of the Geological Surveys Branch. Two assays of this material yielded 20.3% and 21.0% Sn. Claims in the area were staked by *Brunswick Mining and Smelting Corporation Limited* and explorationists *Sheila Watters* and *William Carter*.

Fuels

N.B. Power continued its test pit operations in the Beersville coal field (Figure 1: 5), Kent County, New Brunswick utilizing a 380W dragline. The purpose of the test pit is to prove the mineability and quality of the coal as well as to identify any potential environmental problems.

Mineral Lands

The total number of claims staked in 1991 was 4571, up 5% from the 1990 total of 4361 (Figure 5, Table 1). At the end of the year, there were 21 350 claims, 6 coal agreements (5976 claim equivalents), 3 potash leases (2382 claim equivalents), and 16 mining leases (931 claim equivalents) in effect, which represent a total claim equivalent of 30 639 (down 1% from 1990). Exploration expenditures reported in assessment reports submitted in 1991 totalled $9 916 301 (Table 1).

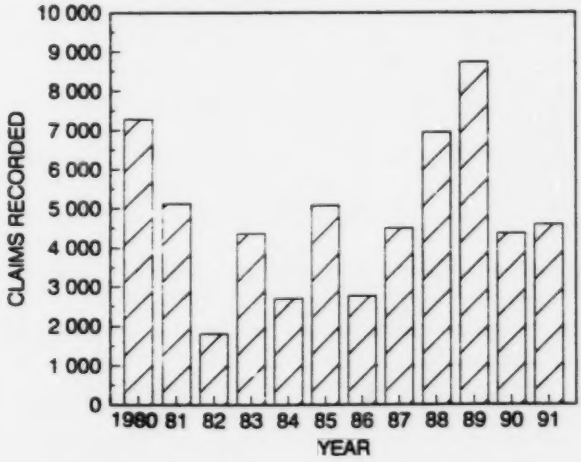

Figure 5. Mineral claims recorded, 1980 to 1991.

DEVELOPMENT

Metallic Minerals

Heath Steele Mines (a Division of Brunswick Mining and Smelting Corporation Limited) carried out rehabilitation work in anticipation of developing the C zone deposit at Heath Steele (Figure 2: 1) and *Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Inc.)* is reviewing the feasibility of mining the copper zone of its Murray Brook mine (Figure 2: 9). For more details see page 15.

TABLE 1. MINERAL LANDS AND EXPLORATION STATISTICS, 1991

Mineral Lands (total in effect at year's end unless specified for 1991)	No.	Claim Equivalent	Hectares	% Inc. Over Prev. Year* (Dec.)
Prospecting Licences	908	-	-	7
Claims Recorded, 1991	4 571	-	73 136	5
Claims Renewed, 1991	17 455	-	279 280	11
Claims Expired, 1991	4 549	-	72 784	(1)
Claims in Effect	21 350	-	341 600	(2)
Coal Agreements	6	5 976	95 616	N/A
Other Agreements	-	-	-	-
Potash Leases	3	2 382	38 112	0
Mining Leases	16	931	14 896	0.4
Total Claims and Claim Equivalents	-	30 639	490 224	(1)
Oil and Gas Licences	1	-	10 058.3	-
Oil and Gas Leases	4	-	13 289	0
Bituminous Shale Licences	-	-	-	-
Bituminous Shale Development Permits	-	-	-	-
Bituminous Shale Leases	1	-	1439	0
Underground Storage Licences	-	-	-	-
Underground Storage Leases	-	-	-	-
Quarry Permits	240	-	-	(24.5)
Quarry Leases	8	-	501.61	4
Peat Licences (issued 1991)	3	-	1 909	-
Peat Licences	3	-	1 909	8
Peat Leases	29		11 409	5

Exploration	Number	Length (m)	Value ($)
Assessment Reports	155		9 916 301
Drilling	216 holes	60 115	3 731 749
Potash Exploration Expenditure			-
Drilling	-	-	-
Oil-Gas Exploration Expenditure			-
Drilling	-	-	-
Bituminous Shale Expenditure			-

* Based on number of hectares, where applicable.

February 15, 1991

Fuels

Canadian Occidental Petroleum Limited holds Bituminous Shale Lease 86-1 in the Albert Mines area of Albert County (Figure 4: 17). A cost-shared study between the company and the Province of New Brunswick under the Canada–New Brunswick Mineral Development Agreement (1984-1989) indicated that it is not presently feasible to co-combust New Brunswick oil shale and coal in a circulating fluidized-bed (CFB) combustor.

OPERATING MINES, WELLS, AND QUARRIES

Production Statistics

The preliminary estimate of New Brunswick's mineral production for 1991 is $617 007 529, which represents a 30% decline from 1990's final value of $877 926 043 (Table 2, Figure 6). This decline is attributable to two main factors: a decline of metal prices partly caused by oversupply in the marketplace, and the extended strike at Brunswick Mining and Smelting Corporation Limited.

The total value of metals produced was $325 545 700, representing 52.7% of the total value of production (Table 2, Figure 6). Zinc, with a value of $212 528 512, continued to account for much of the total value of metal production even though it represents a decrease of 53% from the 1990 figure. This decrease was mainly the result of the strike at Brunswick Mining and Smelting Corporation Limited and declining zinc prices, which ranged from a high of 65.1 US¢/lb. to a low of 44.1 US¢/lb. Lead continued to be the second most valuable contributor to the metals sector at $50 224 782; however, it too was down 25% from the previous year, again because of low prices. Copper production, valued at $27 534 795, was maintained near 1990 levels even though the price declined over the year. Silver prices remained low but stable, as did the value of silver's contribution ($22 869 012) to the metals sector. Antimony, bismuth, and cadmium continued to be produced as byproducts of the Brunswick Mining and Smelting Corporation Limited milling process. Bismuth had a value of $975 000, a 48% increase over 1990, and the value of cadmium production dropped by 15% to $235 000. The Murray Brook mine continued to be the Province's only primary gold producer but byproduct gold from Brunswick No. 12 also contributed to the total value of production for this precious metal. Murray Brook operated for the full year in excess of design capacity and metal recovery.

The nonmetals sector of the industry contributed 34.4% of the value of mineral production, an increase of 23% over 1990. The significant decline in the base metal sector accounted for this, since the actual contribution of the sector was up only marginally over last year's value ($212 321 987). Potash remains the most significant contributor to this sector, with production up slightly against a modest decline in price. Peat, valued at $26 934 000 (Table 2), ranks second in value in this sector, with salt and sulphur in third place. Minor amounts of marl also contribute to this sector. Except for peat and potash, most provincial industrial minerals (nonmetals and structural materials) are consumed domestically. Therefore, sales and production are sensitive to the local economy.

The value of coal produced by N.B. Coal Limited in the Minto–Chipman area was $34 200 000 (Table 2). This represents a slight drop in production from 1990 levels. Irving Oil Limited produced a small amount of natural gas from the Stoney Creek field during 1991.

Structural materials (lime, stone, sand and gravel) maintained a value of $44 939 842, down marginally from the previous year (Table 2, Figure 6). These commodities provide the raw materials for the construction industry in New Brunswick.

In 1991, New Brunswick ranked first in Canada in the production of bismuth and marl, and second in lead, potash, and peat. Overall, New Brunswick ranks eighth out of twelve provinces and territories in its value of mineral production.

Metallic Minerals

Brunswick Mining and Smelting Corporation Limited A labour dispute that began on July 4, 1990 at the company's Brunswick No. 12 mine (Figure 2: 4) and Belledune smelter (Figure 2) continued into 1991. Two union locals, representing 1100 mine workers and 40 smelter workers, were concerned about wages, length of contract, cost of living allowance (COLA), and pension. During the strike, management and staff operated the mine, mill and smelter periodically with production running at 20% to 25%. Confrontation between the unions and management was limited to disruptions of train access to both the mine and smelter; the final few months of the strike were uneventful. A settlement was reached in May of 1991.

The company has indicated that it plans to reduce costs at the facility by 10% and has reduced the number

TABLE 2. MINERAL PRODUCTION IN NEW BRUNSWICK, 1991
(Compiled from Energy, Mines and Resources statistics)

Preliminary Estimate

Commodity	Units	Quantity	Value ($)
Metals			
Antimony	kg	---	---
Bismuth	kg	130 000	975 000
Cadmium	kg	47 000	235 329
Copper	kg	10 138 182	27 534 795
Gold	g	---	---
Lead	kg	59 018 545	50 224 782
Silver	kg	153 057	22 869 012
Zinc	kg	169 886 900	212 528 512
TOTAL			325 545 700
Nonmetals			
Marl	t	---	---
Peat	t	280 056	26 934 202
Potash	t	---	---
Salt	t	---	---
Sulphur (in smelter gas)	t	46 960	6 546 507
TOTAL			212 321 987
Fuels			
Coal	t	500 000	34 200 000
Natural Gas		---	---
TOTAL	m^3		34 200 000
Structural Materials			
Lime	t	---	---
Sand and Gravel (including silica)	t	6 842 540	14 386 675
Stone	t	2 769 713	18 397 674
TOTAL			44 939 842
GRAND TOTAL 1991 (CDN $), preliminary			617 007 529

GRAND TOTAL 1990 (CDN $) $877 926 043

GRAND TOTAL 1989 (CDN $) $864 073 000

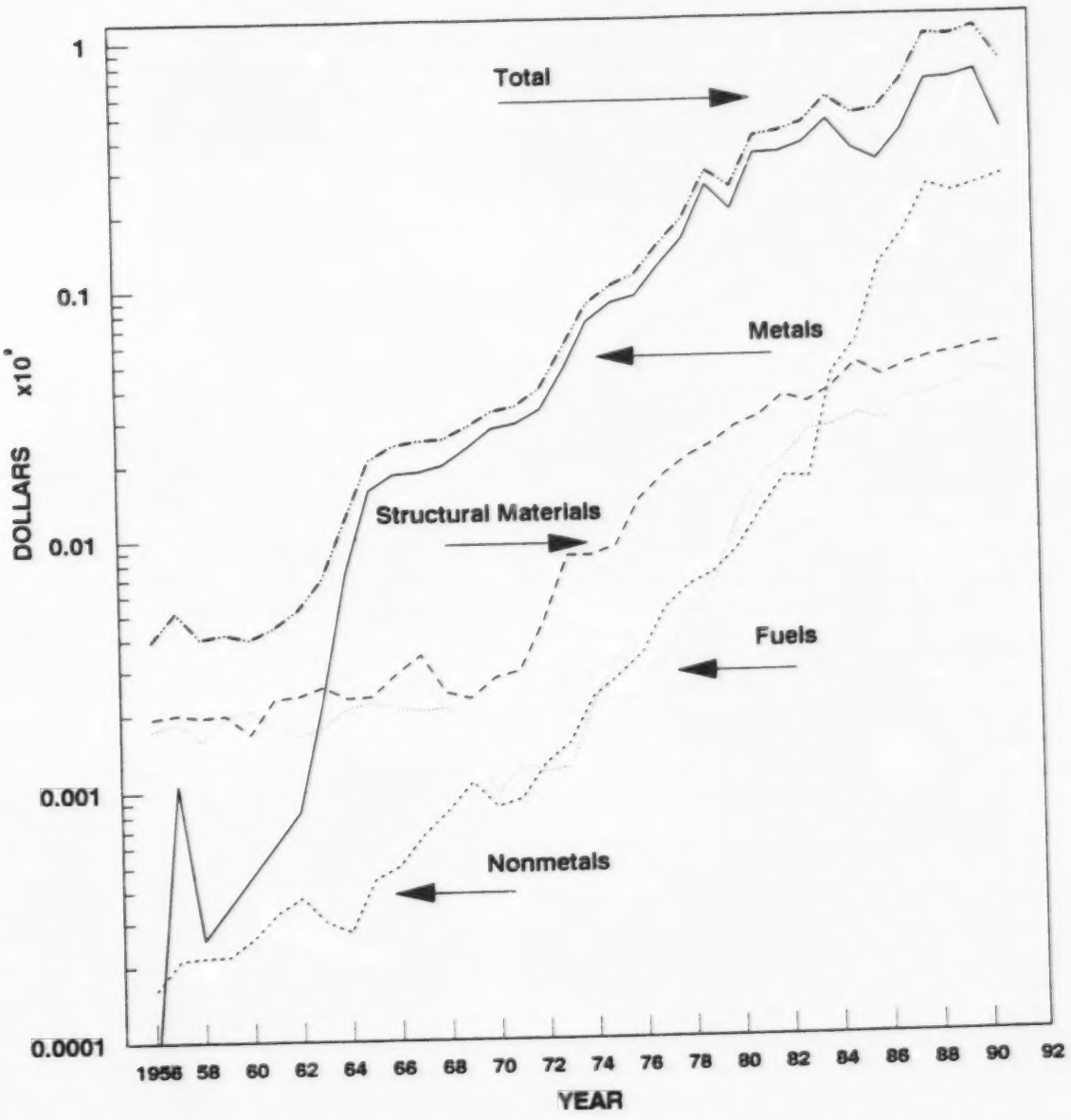

Figure 6. Value of mineral production in New Brunswick, 1956-1991 ($1986 = 100).

of employees at both the smelter and mine through early retirement and voluntary severance. The goal is to reduce the work force at the mine to 900 employees and at the smelter to 300 employees. The smelter has embarked on a plan to become a profitable operation, which requires the concentrate to be upgraded from 34% to 45% lead. Production at the fertilizer plant has been limited due to reduced sulphuric acid output; however, a $5 300 000 hot gas precipitator is being installed to clean sinter plant gases. Management and staff will be able to use the strike experience to aid in the reduction of costs. In addition, the conversion of the mine from mechanized cut-and-fill to open stoping on the 850 level has also contributed to lower costs and improved efficiency. By the end of 1991, costs had been reduced by 15% at the mine and productivity had increased by 30% but this has not been sufficient to cover the losses caused by reduced metal prices and the current recession. Brunswick Mining and Smelting Corporation Limited has reported a loss of $29 000 000 for 1991.

Heath Steele Mines (a Division of Brunswick Mining and Smelting Corporation Limited) Production at the Heath Steele mine (Figure 2: 1) continued throughout 1991. The company maintained its planned mine production and mill recoveries but was hard hit by soft base metal prices. During 1991, the primary sources of ore were the company's Stratmat and B zone deposits; in addition, two campaigns of ore from the Captain North Extension deposit (see Stratabound Minerals Corp., p. 16) were milled at Heath Steele. One of the company's key objectives is to expand its existing reserves through a comprehensive exploration programme. Much exploration has been conducted on the Heath Steele lease where the C zone appears to be the most promising. A significant amount of underground exploration was conducted in this zone in the past. The company will continue to explore the C zone in 1992. Heath Steele completed its review of the economic feasibility of the C zone in January, 1991 and received conditional approval from its Board of Directors to proceed with Phase I of the project.

Phase I consists of dewatering the A pit, rehabilitating the ramp connecting the A pit to the new C zone, and conducting underground exploration. In addition, the 400 m No. 4 shaft will be rehabilitated to allow secondary access to the C zone. Currently, 1 850 000 t of ore grading 7.6% zinc and 1.5% lead have been outlined in the C zone with good potential for more. The development of the C zone will extend the life of the operation from the current five years to seven years and expanding the rate of milling from the current 2400 t/d to 3000 t/d. Phase I was originally expected to cost $4 000 000 but has been lowered because of limited availability of financing. As a result, underground exploration drilling will be carried out from presently accessible areas.

Phase II, the production development stage, will proceed based on the results of Phase I. The original cost was estimated to be $16 000 000. Noranda Inc. is seeking a joint venture partner to fund the Phase II portion of the plan and has stated that the sale of the entire Heath Steele property may be considered if the price is right.

An Environmental Impact Assessment (EIA) screening was completed for Heath Steele's development of the C zone. Subsequent approval was conditional on the posting of a $6 100 000 rehabilitation security. This security has been posted, the A pit has been drained, and the refurbishing of No. 4 shaft is underway.

In February, a pipe carrying contaminated mine water from the B zone ruptured, causing contamination of the Little South Tomogonops River. As well as taking steps to ensure that the spill does not occur again, the company embarked on a process to determine its impact on the river and its fish population. The company was taken to court by the Department of the Environment and fined $30 000.

In spite of the fact that Heath Steele Mines is a wholly owned subsidiary of Brunswick Mining and Smelting Corporation Limited, the extended strike at Brunswick did not prevent Heath Steele and its union from reaching a satisfactory agreement. Under the contract, workers will receive an average increase of 21% over 37.5 months commencing on November 14, 1990 and ending December 31, 1993.

Murray Brook Resources Inc. (a wholly owned subsidiary of NovaGold Resources Ltd.) The Murray Brook mine (Figure 2: 9) continued to be a productive member of the mining community in 1991 and exceeded design production and recovery rates. In 1991, the mine produced 631 730 g (20,312 oz.) of gold and 5 409 361 g (173,915 oz.) of silver at an average cost of $250 per ounce. Recoveries were 85% for gold and 17% for silver. The gold mining portion of the operation should be completed in 1992.

The feasibility of mining the copper-rich part of the deposit is currently under review and could add an additional six years to the life of the operation. Murray Brook's parent company, NovaGold Resources Inc., continues to seek new technology to facilitate the processing

of New Brunswick's ores.

The company is assessing the ferric chloride leach (FCL) process as a possible means of treating the copper portion of the Murray Brook deposit. The initial study, carried out with the assistance of CANMET, produced promising results that led NovaGold to enter into an agreement with CANMET to acquire a licence for the use of the process in New Brunswick and the Northwest Territories. FCL is an advanced technology that can efficiently recover nonferrous metals from sulphide base-metal ore and that has the potential to significantly increase metal recoveries and revenues. It also has the capability to produce a finished metal as its final product, thus eliminating the environmentally undesirable smelting aspect of metal processing. NovaGold is currently striving to set up a pilot plant for the process somewhere in the Province.

Stratabound Minerals Corp. Following the successful milling of a bulk sample at Heath Steele Mines in September of 1990, Stratabound Minerals Corp. completed a feasibility study to confirm the economic viability of the Captain North Extension (CNE) deposit (Figure 2: 7). At the same time, the mine approval process was started and discussions were begun with Heath Steele Mines concerning a contract for future production from the CNE property. Work to prepare the deposit for production was completed in August. An agreement was made with Heath Steele for the sale of Stratabound's ore and the company received its Mining Lease and other required permits during the same period. Approximately 13 500 t of ore was mined in September and December for shipment to Heath Steele from the CNE north pit; subsequent mining will be based on Heath Steele's mill production schedule and capacity requirements. The mining life of the deposit will depend on the rate at which Heath Steele processes the ore and any future extension of reserves at the CNE site. At present, it is expected to be about two years at an average mining rate of 180–270 t/d. The pit contains a reserve of 207 575 t averaging 7.38% zinc, 2.76% lead, and 91.9 g/t silver, based on a cutoff grade of 8% combined lead–zinc.

Suspended Operations *Marshall Minerals Corp.* completed its Environmental Impact Assessment (EIA) report for the Restigouche project (Figure 2: 27) and in August 1990, received a positive response from the Lieutenant-Governor-in-Council to proceed in the development of the project. A security of $1 600 000 will be required to ensure the environmental integrity of the operation.

Because the deposit is not large enough to support a mill, the company had hoped to enter into an agreement with East West Caribou Mining Limited to process the Restigouche ore. The cost of bringing the property into production is estimated to be $3 000 000; production is expected to be about 1500 t/d from an open pit operation that would employ about 50 people over 4 years. Marshall has proceeded no further than the EIA approval in its acquisition of other required government approvals and has put the deposit up for sale. The sharp downturn in zinc prices and the closure of the Caribou operation contributed to the company's decision to concentrate on properties outside the Province.

East West Caribou Mining Limited suspended its operations at the Caribou mine (Figure 2: 28) on October 26, 1990. Since that time, activity at the site has been limited to maintenance by 15 employees who ensure that the infrastructure is preserved for immediate start-up. They also ensure the environmental integrity of any effluent leaving the site. Although the property is for sale, the parent company, Breakwater Resources Ltd., is actively seeking a partner to restart the operation. A number of interested parties have looked at the site but no agreement was concluded in 1991. Breakwater Resources Ltd. is restructuring and hopes that this will put the company in a better position to reopen the mine using alternate technological processes. Sale of the property is also a possibility.

Fuels

Irving Oil Limited The company produced 93 408 m^3 of natural gas from the Stoney Creek field (Figure 4: 18) in Albert County between January 1 and March 31, 1991, at which time production was terminated.

N.B. Coal Limited Production from N.B. Power's subsidiary company, N.B. Coal Limited, continued in the Minto–Chipman area (Figure 4: 19). A total of 490 000 t of coal was produced in 1991. The coal was supplied to the power generating facilities in Dalhousie and Grand Lake, New Brunswick.

Erection of the new 35-yard Bucyrus-Erie 1260 dragline commenced in April of 1991 and is planned to commence operation on April 1, 1992.

In 1991, N.B. Coal Limited disturbed 91 ha of land but continued to meet its reclamation obligations by rehabilitating 162 ha of disturbed land.

Industrial Minerals

Several industrial minerals are mined in the Province. They fall into three categories: (1) 'consolidated' rocks or minerals such as potash, salt, building stone, shale, granite, limestone, dolomite, silica, and gypsum; (2) unconsolidated commodities such as marl, sand and gravel, clay, soil and peat; and (3) industrial mineral byproducts such as sulphur.

The strategic location and development of suitable sources of high-specification bedrock aggregate are important because of plans to upgrade the Province's highway system, particularly the Trans-Canada Highway and its arterial roads. Considerable expansion of some producing quarries and the establishment of new strategically located enterprises are expected. There is also potential for export to the northeastern United States.

Aggregate, an important part of the Province's construction industry, is derived from granular and bedrock deposits. More than 60 companies produce aggregate from numerous pits and quarries throughout the Province.

Most sand and gravel pits in New Brunswick are operated on an intermittent, on-demand basis. While many produce low-specification material, a few companies produce good quality material from large sand and gravel deposits. These are more permanent operations that lie within economical trucking distance of high-demand urban areas. The pits and processing facilities of *Brunswick Ready-Mix Concrete Ltd.* are at Blagdon, 25 km north of Saint John (Figure 4: 20).

Historically, aggregate from bedrock sources has been produced from ten to twelve quarries within the Province. There are large quarries in the Moncton, Saint John, and Fredericton areas with smaller ones in the Campbellton, Havelock, and Elmtree areas.

The New Brunswick limestone industry consists of five producers: Brookville Manufacturing Company Ltd. near Saint John (Figure 4: 21), Lafarge Canada Inc. and Havelock Lime west of Moncton (Figure 4: 22-23), Elmtree Resources Ltd. north of Bathurst (Figure 2: 29), and Upper Kent Lime Works Ltd. north of Woodstock (Figure 1: 6). These operations produce several hundred thousand tonnes of limestone annually.

Brookville Manufacturing Company Ltd. produces agricultural dolomitic limestone, fertilizer filler, roofing granules, concrete and asphalt aggregate, driveway aggregate, road metal and hardpack road subbase from its quarries at Brookville in East Saint John (Figure 4: 21). Annual production generally exceeds 200 000 t of limestone/dolomite.

Lafarge Canada Inc. operates a quarry several kilometres east of Havelock in Westmorland County (Figure 4: 22). Cement was produced at this location on a regular basis until the early 1980s. After 1982, production of cement from local raw material was limited to fulfilling market requirements for oil well and other specialty cements. The plant was maintained as a grinding operation for imported Nova Scotia clinker until 1987 when the operations were suspended indefinitely. The plant now serves as a distribution point for products from other company operations. The plant's adjacent limestone quarry continues to be operated, supplying raw limestone to Havelock Lime. Aggregate is also supplied to a subsidiary company, Permanent Concrete Ltd.

Havelock Lime (a division of Dickenson Mines Ltd.), at Havelock (Figure 4: 23), produces calcitic agricultural lime, industrial and chemical process stone, and crushed stone for aggregate. Havelock Lime is Atlantic Canada's only producer of calcined and hydrated lime. Annual quarry output and crusher feed generally exceeds 300 000 t. A recently installed Fuller annular-shaft kiln, the first of its kind in North America, has increased the calcining capacity of the operation to approximately 300 t/d. A new 9 t/h hydrator was commissioned in 1989.

Traditionally, the source of supply for the operation has been a quarry at Samphill. In recent years, the high ratio of overburden to limestone at this quarry has limited production. As a result, Havelock Lime has negotiated a long-term agreement with Lafarge Canada Inc. to ensure supply from a nearby quarry.

Elmtree Resources Ltd. operates a quarry and crushing and pulverizing plant about 20 km north of Bathurst near the Village of Petit Rocher (Figure 2, 29). Annual production exceeds 50 000 t. Limestone is sold primarily to the lead smelter at Belledune as flux and, to a lesser extent, to other customers as aggregate, fertilizer filler, and agricultural limestone. Although remaining limestone reserves at a quarry adjacent to the processing facility are limited, two other deposits in the region have

recently been evaluated. These have inferred reserves probably sufficient for several decades at current production levels. In 1991, the company was selected to supply limestone to N.B. Power's coal-fired power station at Belledune. Commencing in 1993, the Belledune station will require about 100 000 t of limestone (92.0–93.5% $CaCO_3$) per year for use in its acid gas scrubber.

Upper Kent Lime Works Ltd. produces marl from the bed of a small drained lake (White Mud Lake) at Maplehurst, Carleton County (Figure 1: 6). Annual marl sales to the region's farmers probably do not exceed a few thousand tonnes.

Dimension stone in the form of various sandstone and granite products have been quarried and fabricated in New Brunswick for many years. There has been a modest revival of interest in the Province's dimension stone, mainly in the fields of restoration and renovation (e.g., buildings and bridges).

Smith Cut Stone and Quarries Limited, in Westmorland County, has produced an olive-green sandstone at its Shediac facility (Figure 1: 7) since the early 1800s. The company also utilizes this facility to process stone from a variety of locations.

Nelson Monuments Ltd., Sussex (Figure 4: 24), is the largest dimension stone company in the Maritimes. The firm presently owns several granite quarries throughout southern New Brunswick, including Spoon Island, Dawson Mountain, and Digdeguash Lake. They are generally operated on a demand basis. The Spoon Island quarry is the most active. The company uses mainly imported stone to produce monuments. Bases for memorial stones, curbing stone, and many custom-made products are manufactured from domestic stone resources.

Dupuis Cut Stone Ltd. manufactures ornamental and landscape stone products at its facility near Shediac, Westmorland County (Figure 1: 8).

BEE Stone Company Inc. One of several abandoned quarries in the Fort Folly Point area south of Moncton (Figure 4: 25) was reactivated in 1989 by BEE Stone Company Ltd. and continued to operate on a demand basis, supplying sandstone for both new construction and restoration projects.

The potash industry continues to form the backbone of New Brunswick's industrial mineral production. In 1990, production reached a level of about 1 600 000 t, representing an 8% increase over 1989's production level. In 1991, the industry employed about 950 people. Combined production capacities from the Province's two potash mines is near 2 000 000 t of KCl product annually, about 10% of Canada's total.

Two companies operate potash mines and associated processing facilities.

Potash Company of America (a division of Rio Algom Ltd.) operates the potash mine and concentrating facility in the Sussex area (Figure 4: 26). The company also operates a potash shipping terminal at Saint John, less than 80 km to the southwest.

In June of 1978, Potash Company of America and the Province of New Brunswick signed a mining lease covering an area of 19 187 ha.

Mining began in 1983, but at a level much lower than the mine's rated capacity of 380 000 t K_2O annually. A number of technical improvements at the Potash Company of America mine over the last two years have resulted in record levels of ore production and mill recovery. The facility operated at slightly above its original rated capacity in 1990.

A cut-and-fill mining method is employed in the mine, where continuous mining machines are utilized.

Potacan Mining Company (formerly Denison-Potacan Potash Company) potash mine commenced production at its Clover Hill site (Figure 4: 27) in July of 1985, after about six years of shaft sinking, exploration and construction.

Modified room-and-pillar mining methods employing both continuous mining equipment and drill-and-blast technology are used to extract ore several hundred metres below surface.

In 1991 the mine achieved production levels near 80% of design capacity (780 000 t K_2O), a 10% increase over 1990. Recent implementation of a hydraulic backfill system should ultimately improve ore extraction rates. A new crystallization circuit in the mill has raised recovery rates to 90.4%. Innovations to the compaction and screening stages of the milling process have enhanced product separation and quality.

In early 1991, Denison Mines Limited sold its 60% share of the Denison-Potacan Potash Company to the Potash Company of Canada Limited, a partnership of German and French interests. The name of the operation was changed to Potacan Mining Company.

Potash from both Sussex area mines is transported to the Port of Saint John. At the port, it is stored in buildings having a capacity exceeding 100 000 t.

Elmtree Resources Limited In 1988, Elmtree Resources Limited acquired the silica quarry at Bass River, about 7 km east of Bathurst (Figure 2: 30). The company intends to operate the quarry pending market demand.

Sussex Silica Inc. has been operating a quarry near Cassidy Lake since 1986. The deposit, located 22 km southwest of Sussex (Figure 4: 28), consists of unconsolidated quartzose sand and gravel. The material is extracted from an open pit, washed, and screened. The product is marketed for use as smelter flux, silicon metal, silicon carbide, and sand blasting and decorative sand. In 1989, a sample of the sand was tested and proved satisfactory for the manufacture of glass.

Capacity of the Sussex Silica operation is estimated to be 80 000 t annually. There is potential for expansion if market demand warrants.

Peat Preliminary figures indicate that peat shipments in 1991 totalled about 7 500 000 standard bales (260 000 t), an increase from 1990.

Twelve companies were producing from twenty-five bogs and two other bogs were under development.

During peak production, approximately 920 people (including seasonal workers) were employed.

A preliminary estimate of the value of 1991 shipments is $36 000 000.

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